Alberta traffic collision statistics

1990

Safety in Motion

Alberta
TRANSPORTATION
AND UTILITIES

ALBERTA TRAFFIC COLLISION STATISTICS 1990

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1990 Overview

- The number of traffic **fatalities decreased 16.0%** over the past year from 487 deaths in 1989 to 409 deaths in 1990.
- The number of **traffic injuries decreased 5.8%** over the past year from 19,753 injuries in 1989 to 18,604 in 1990.
- The number of **traffic collisions decreased 0.4%** over the past year from 120,364 collisions in 1989 to 119,895 in 1990.
- **More fatal collisions** occurred between **July and September.**
- **Friday** was the most collision-prone day of the week. However, the majority of fatal collisions occurred on Saturday.
- The most collision-prone period of time was the **afternoon rush-hour.**
- **Casualty rates** were highest for persons between the **ages of 15 and 24.**
- **Male drivers** between the **ages of 16 and 19** had the highest involvement rate of all drivers involved in casualty collisions.
- **Driver error** was recorded for 53% of drivers involved in casualty collisions.
- **Fatal collisions** occurred most frequently in **rural areas,** whereas **injury and property damage only collisions** occurred more frequently in **urban areas.**
- **22.1% of drivers** involved in **fatal crashes had consumed alcohol prior to the crash** compared to **9.4% of drivers in injury crashes.**
- As the percentage of seat belt use **increased,** the severity of occupant injury **decreased**.

Preface

The purpose of this report is to provide an overview of the "who", "what", "when", "where", "why", and "how" of traffic collisions which occurred in Alberta during 1990. Although the report is general in nature, it pays particular attention to casualty collisions, that is, those collisions which resulted in death or injury. Since 1984, limited information is collected for crashes involving only property damage.

Legislation in Alberta requires that a traffic collision, which results in either death, injury or property damage to an apparent extent of $500.00 or more, be reported immediately to an authorized peace officer. The officer completes a standardized collision report form which provides information on various aspects of the traffic collision. This report is based on the data collected from these report forms.

The collision report form is issued with standard instructions to every police force within Alberta, to be completed by the officer attending the scene of a motor vehicle crash. Police priorities at the scene of a crash are to care for the injured, protect the motoring public and clear the roadway. Completion of the collision report form is a secondary, but necessary task.

After completion, the information on the collision report form is coded for input to computer files. The Alberta Collision Information System, which has been operational since 1978, undergoes several manual and computerized inspections each year in order to ensure maximum accuracy of the final data output.

Due to continuing police investigation, some numbers presented in this report may be subject to revision. It should also be noted that not all percentage columns will total 100 due to rounding error. However, the patterns and trends detailed in this report represent an accurate description of Alberta's traffic collision picture.

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Glossary

Alcohol Impaired - In the judgement of the police officer, driving ability was impaired by alcohol consumption. Whether or not the subject was actually charged is not taken into consideration by the collision report form.

Casualty Collision - A vehicle collision which results in either a fatality or personal injury.

Drinking Driver - Refers to those drivers judged by the police officer as having been drinking prior to the crash or as being alcohol impaired at the time of the crash. Whether or not the driver was actually charged is not taken into consideration by the collision report form.

Fatality - A fatality is the death of a person that occurs as a result of a motor vehicle collision within 30 days of the collision.

Had Been Drinking - In the judgement of the police officer, the driver had recently consumed alcohol but his driving ability was not obviously impaired.

Major Injury - Persons with injuries or complaint of pain that went to the hospital and were subsequently admitted even if for observation only.

Minor Injury - Persons with injuries or complaint of pain that went to the hospital, were treated in emergency (or refused treatment) and SENT HOME without ever being admitted to the hospital.

Motorcyclist - Refers to drivers and passengers of motorcycles.

Occupant Casualties - Refers to people who were injured or killed as a result of a vehicle collision and were identified as being either a vehicle driver or passenger.

Property Damage Only - A vehicle collision which resulted in property damage only, exceeding $500.00.

Reportable Collision A vehicle collision which resulted in death, injury or property damage greater than $500.00.

Rural - Any area outside of that defined as 'urban'.

Urban - Any area within the corporate boundaries of a city, town, or village.

1990 Traffic Collision Summary

Introduction

During 1990, 119,895 collisions were recorded on Alberta roadways. Property damage only crashes (over $500) represented 89.2% (106,919) of this total while 10.5% (12,619) were non-fatal injury collisions. Fatal crashes accounted for 0.3% (357) of the total reported collisions.

Five Year Trends

The fatal collision rate and fatality rate, in terms of 10,000 population, dropped in 1990 to a five-year low of 1.4 and 1.7, respectively.

Non-fatal injury collision rates and non-fatal injury rates have decreased in 1990, after increasing in 1989. In 1990, the non-fatal injury collision rate, in terms of 10,000 population, stands at 51.1.

In terms of 10,000 population, property damage and total collision rates now stand at 432.9 and 485.4, respectively, down from 1989.

Provincial Comparisons

In order to get a clear picture of Alberta's traffic injuries in comparison to other provinces, rates rather than absolute numbers are utilized. In this instance, rates per 10,000 population were examined.

In 1990, three provinces, British Columbia, New Brunswick, and Prince Edward Island, recorded higher fatality rates than Alberta in terms of 10,000 population. However, only one province, Newfoundland, recorded a lower injury rate per 10,000 population.

Table 1.1

Alberta Traffic Collisions
1986 - 1990

Severity of Collision	1990	1989	1988	1987	1986
Fatal Collisions	357	408	395	425	430
Non-Fatal Injury Collisions	12619	13234	12728	13088	14383
Property Damage Only Collisions	106919	106722	97141	83980	82372
Total Reportable Collisions	**119895**	**120364**	**110264**	**97493**	**97185**
Number Killed	409	487	464	510	523
Number Injured	18604	19753	18777	19809	22148
Total Number of Casualties	**19013**	**20240**	**19241**	**20319**	**22671**

Observations

In 1990, the overall number of collisions decreased 0.4% when compared to 1989. In 1990, injury collisions decreased 4.6% while fatal crashes decreased 12.5%. The number of fatalities has decreased by 16.0% from 1989 to 1990, and the number of injuries decreased by 5.8%. In terms of the past five years, overall collisions increased from 1986 to 1989, and decreased slightly in 1990.

Table 1.2

Traffic Collision Rates
1986 - 1990

	Rate Per 10,000 Population*					Rate Per 10,000 Licensed Drivers*					Rate Per 10,000 Registered Vehicles*				
Severity of Collision	**1990**	**1989**	**1988**	**1987**	**1986**	**1990**	**1989**	**1988**	**1987**	**1986**	**1990**	**1989**	**1988**	**1987**	**1986**
Fatal Collisions	1.4	1.7	1.6	1.8	1.8	1.9	2.2	2.2	2.3	2.4	1.9	2.2	1.8	2.0	**
Number Killed	1.7	2.0	1.9	2.1	2.2	2.2	2.6	2.6	2.8	2.9	2.2	2.7	2.2	2.4	
Non Fatal Injury Collisions	51.1	54.5	53.1	55.0	60.3	67.1	71.4	70.0	72.3	78.9	67.2	72.7	59.1	61.9	
Number Injured	75.3	81.3	78.4	83.2	92.9	98.9	106.6	103.2	109.4	121.5	99.1	108.5	87.2	93.7	
Property Damage Only Collisions	432.9	439.3	405.6	352.8	345.4	568.6	575.7	533.9	464.0	452.0	569.3	586.4	451.3	397.1	
Total Reportable Collisions	**485.4**	**495.5**	**460.4**	**409.6**	**407.5**	**637.7**	**649.3**	**606.1**	**538.7**	**533.4**	**638.3**	**661.4**	**512.2**	**461.0**	

Observations

The fatal collision rate and fatality rate, in terms of population, licensed drivers, and registered vehicles, dropped in 1990.

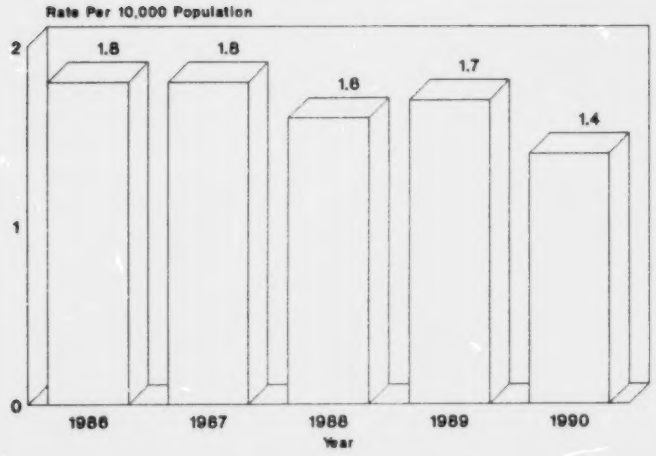
Non-fatal injury collision rates and non-fatal injury rates have decreased in 1990, after increasing in 1989.

Property damage and total collision rates have also dropped in 1990 after reaching a five year high in 1989.

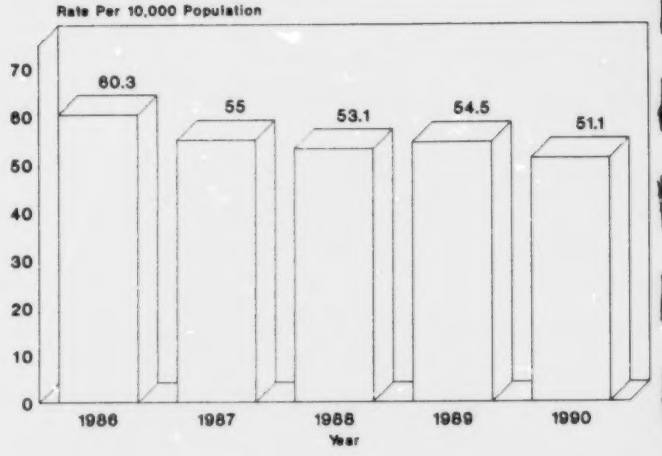
*Sources
Population - Based on estimates of the population by age and sex, June 1, 1990, supplied by the Alberta Bureau of Statistics.
Licensed Drivers - Motor Vehicles Division, Alberta Solicitor General, as of December 31, 1990.
Registered Vehicles - Motor Vehicles Division, Alberta Solicitor General, as of March 31, 1990.

** Data for 1986 is not comparable to 1987 - 1990 and therefore is not included in this table.

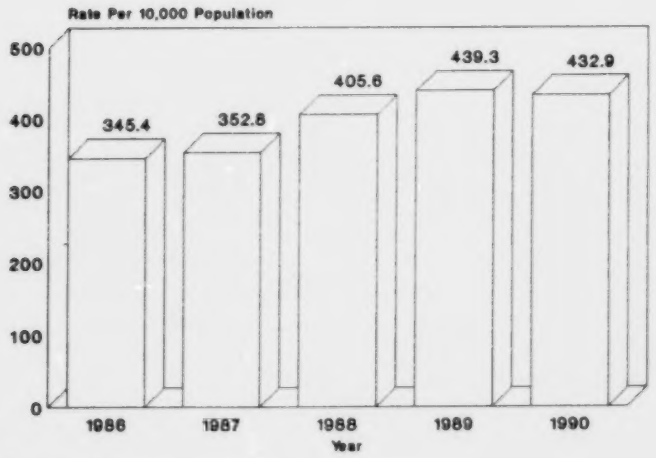
ALBERTA FATAL COLLISION RATES
1986-1990



ALBERTA INJURY COLLISION RATES
1986-1990



ALBERTA PROPERTY DAMAGE COLLISION RATES
1986-1990



ALBERTA OVERALL COLLISION RATES
1986-1990

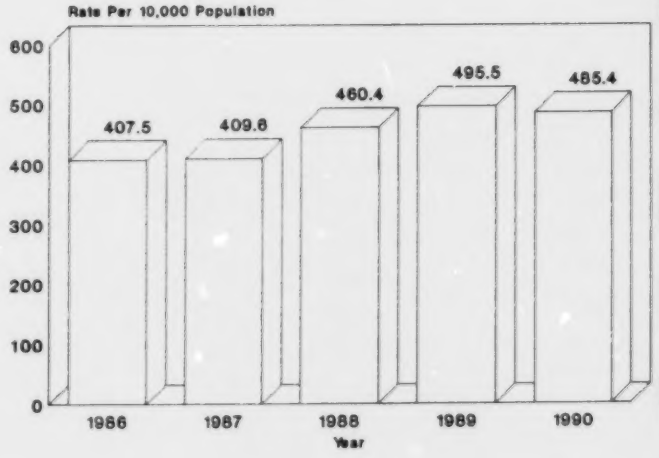


Figure 1

Table 1.3

Provincial Comparison of Casualty Rates Per 10,000 Population
1986 - 1990

	1990		1989		1988		1987		1986	
	Fatal	Injury	Fatal	Injury	Fatal	Injury	Fatal	Injury	Fatal	Injury
Alberta	1.7	75.3	2.0	81.3	1.9	78.4	2.1	83.3	2.2	93.3
British Columbia	2.1	160.7	1.9	155.4	2.1	148.0	2.1	141.2	2.1	139.8
Saskatchewan	1.5	76.7	1.9	80.8	2.0	86.3	2.3	89.9	2.4	87.4
Manitoba	1.1	123.4	1.4	122.9	1.3	110.6	1.5	110.6	1.6	105.9
Ontario	*	*	1.3	126.1	1.3	125.5	1.3	130.7	1.2	119.4
Quebec	1.6	78.6	1.7	85.9	1.6	89.2	1.7	91.1	1.6	89.1
New Brunswick	2.2	100.6	2.1	105.0	2.3	99.3	2.1	96.2	1.8	88.2
Nova Scotia	1.7	*	1.4	69.7	1.7	62.4	1.8	64.5	1.5	57.7
Prince Edward Island	2.2	83.2	1.4	76.1	1.6	73.8	1.4	78.2	2.3	63.6
Newfoundland	1.2	53.7	1.6	56.1	1.0	57.5	1.0	53.6	1.0	45.8

Observations

During 1990, for the provinces where information was available, three provinces, British Columbia, New Brunswick, and Prince Edward Island, recorded higher fatality rates than Alberta in terms of 10,000 population. However, only one province, Newfoundland, recorded a lower injury rate per 10,000 population than Alberta.

Sourses: Casualty statistics supplied by each province. Population estimates, as of June 1, 1990, Statistics Canada.

* Not avalilable at time of printing.

PROVINCIAL TRAFFIC FATALITY RATES
Per 10,000 Population
1990

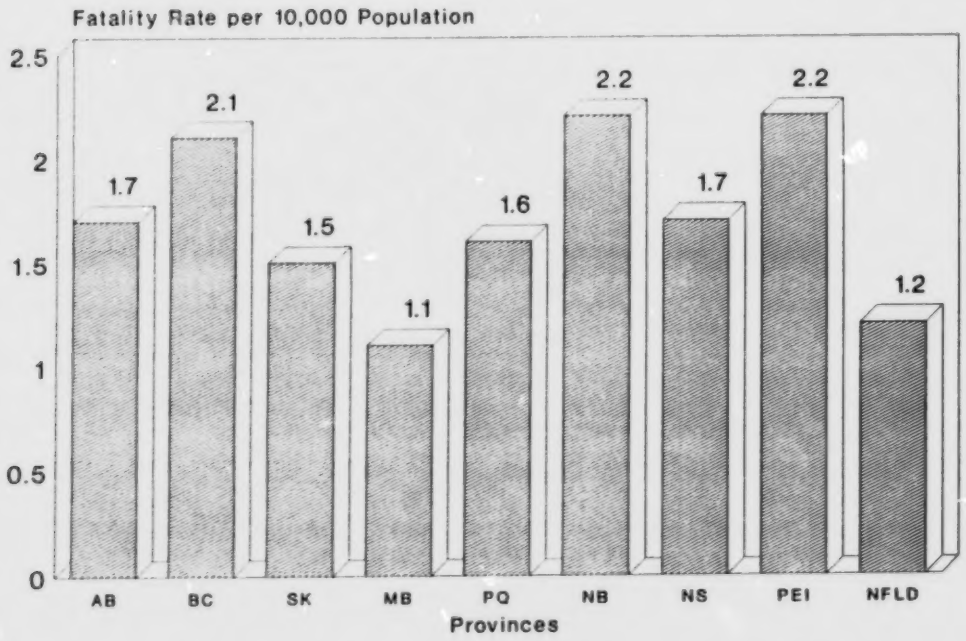


Figure 2

When the Collisions Occurred

Month

The months of July and September experienced more casualty collisions than other months. The highest number of property damage only collisions was recorded during the month of November.

Day of Week

The daily distribution of collisions indicated that Friday was the most collision-prone day of the week. The largest number of fatal crashes occurred on Saturday.

Time

The afternoon rush hour period (3:00 p.m. - 6:59 p.m.) accounted for the highest proportion of collisions. The least collision - prone time period was the early morning (3:00 a.m. - 6:59 a.m.).

Holidays

The six day Christmas season recorded the greatest number of traffic collisions for a holiday period in 1990. The 1990 Labor Day long weekend recorded the highest total number of deaths.

Table 2.1

Collision Occurrence by Month
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Month	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
January	28	7.8	915	7.3	10256	9.6	11199	9.3
February	27	7.6	906	7.2	10288	9.6	11221	9.4
March	29	8.1	946	7.5	8704	8.1	9679	8.1
April	22	6.2	835	6.6	6946	6.5	7803	6.5
May	25	7.0	1059	8.4	7367	6.9	8451	7.0
June	27	7.6	1159	9.2	8546	8.0	9732	8.1
July	37	10.4	1299	10.3	8460	7.9	9796	8.2
August	39	10.9	1139	9.0	8336	7.8	9514	7.9
September	40	11.2	1200	9.5	7614	7.1	8854	7.4
October	29	8.1	1023	8.1	8243	7.7	9295	7.8
November	24	6.7	1009	8.0	11560	10.8	12593	10.5
December	30	8.4	1129	8.9	10572	9.9	11731	9.8
Unspecified	-	-	-	-	27	0.0	27	0.0
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**106919**	**100.0**	**119895**	**100.0**

Observations

The months of July, August and September experienced the most fatal crashes. The months of July and September experienced more non-fatal injury collisions than other months. The highest number of property damage only collisions was reported in the month of November.

Table 2.2

Collision Occurrence by Day of Week
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Day of Week	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Monday	49	13.7	1686	13.4	15188	14.2	16923	14.1
Tuesday	45	12.6	1748	13.9	15285	14.3	17078	14.2
Wednesday	41	11.5	1666	13.2	15224	14.2	16931	14.1
Thursday	55	15.4	1812	14.4	15798	14.8	17665	14.7
Friday	56	15.7	2148	17.0	18516	17.3	20720	17.3
Saturday	65	18.2	1936	15.3	15289	14.3	17290	14.4
Sunday	46	12.9	1623	12.9	11619	10.9	13288	11.1
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**106919**	**100.0**	**119895**	**100.0**

Observations

The daily distribution of collisions indicated that overall Friday was the most collision-prone day of the week, followed by Thursday and Saturday. The largest number of fatal crashes occurred on Saturday.

Table 2.3

Collision Occurrence by Time Period
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Time Period	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
11:00 p.m.- 2:59 a.m.	48	13.4	1183	9.4	8658	8.1	9889	8.2
3:00 a.m. - 6:59 a.m.	23	6.4	716	5.7	4459	4.2	5198	4.3
7:00 a.m. - 10:59 a.m.	64	17.9	1976	15.7	18421	17.2	20461	17.1
11:00 a.m. - 2:59 p.m.	60	16.8	2714	21.5	26291	24.6	29065	24.2
3:00 p.m. - 6:59 p.m.	87	24.4	3702	29.3	29897	28.0	33686	28.1
7:00 p.m. - 10:59 p.m.	71	19.9	2146	17.0	16664	15.6	18881	15.7
Unspecified	4	1.1	182	1.4	2529	2.4	2715	2.3
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**106919**	**100.0**	**119895**	**100.0**

Observations

The afternoon rush hour period (3:00 p.m. - 6:59 p.m.) accounted for the largest percentage (28.1%) of collisions occurring in a 24 hour period. The least collision - prone time period was the early morning (3:00 a.m. - 6:59 a.m.).

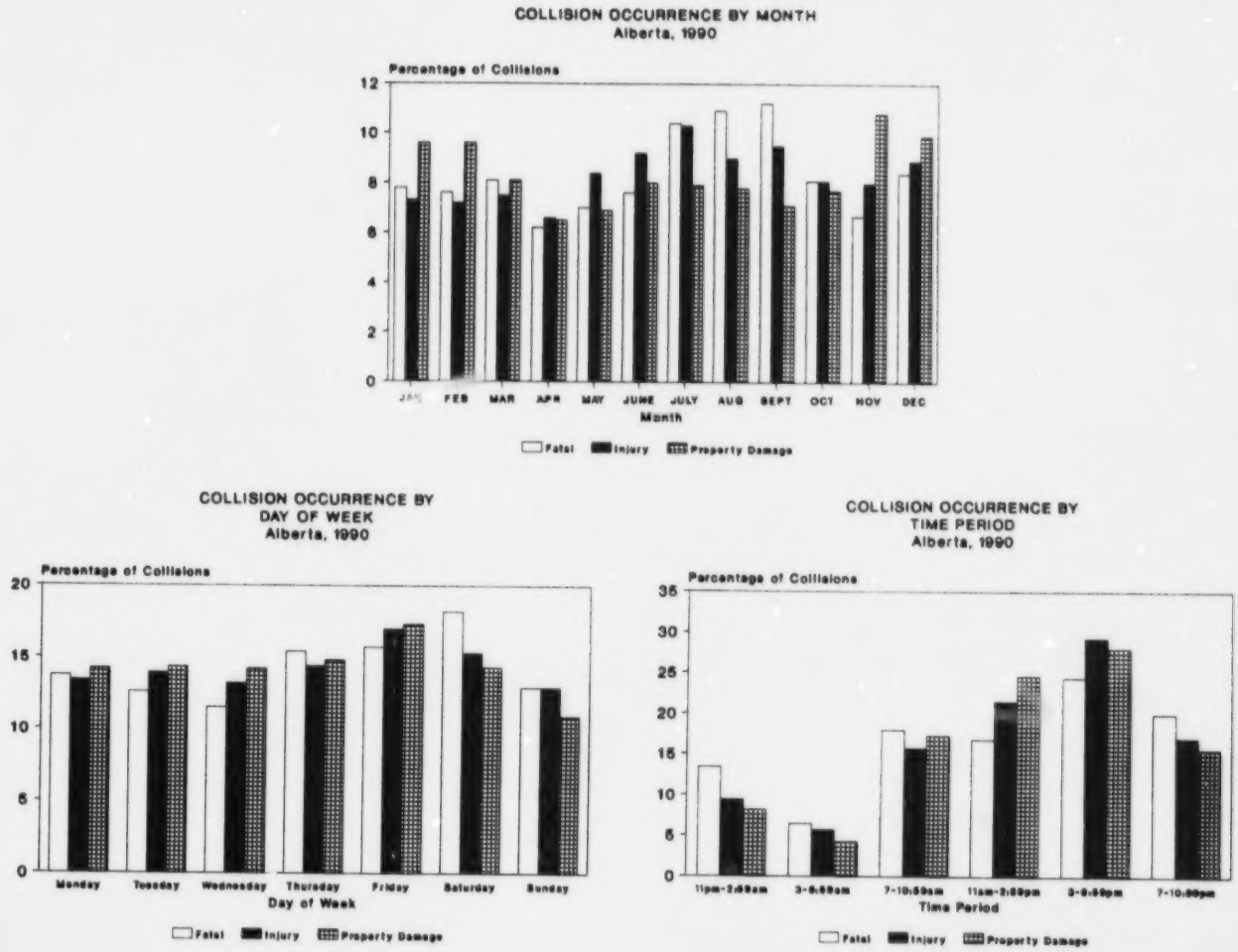

COLLISION OCCURRENCE BY MONTH
Alberta, 1990
Percentage of Collisions
12
10
8
6
4
2
0
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
Month
Fatal
Injury
Property Damage
COLLISION OCCURRENCE BY
DAY OF WEEK
Alberta, 1990
Percentage of Collisions
20
15
10
5
0
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Day of Week
Fatal
Injury
Property Damage
COLLISION OCCURRENCE BY
TIME PERIOD
Alberta, 1990
Percentage of Collisions
35
30
25
20
15
10
5
0
Time Period
Fatal
Injury
Property Damage

Figure 3

Table 2.4

Collisions During 1990 Holidays

Holidays	Number Killed N	Number Injured N	Total Collisions* N
New Year's Day (January 1)	0	23	229
Easter (April 12-16)	9	188	1076
Victoria Day (May 18-21)	5	239	963
Canada Day (June 29 - July 2)	5	266	1249
August Long Weekend (August 3-6)	9	292	1161
Labour Day (August 31- September 3)	12	266	1135
Thanksgiving (October 5-8)	7	222	1225
Remembrance Day (November 9-12)	2	194	1794
Christmas Season (December 21-26)	11	457	2183
Total	**60**	**2147**	**11015**

Observations

The four-day Labour Day long weekend period recorded the highest number of individuals killed. The six day Christmas season recorded the highest number of total collisions.

* Total collisions includes fatal, injury, and property damage only collisions.

Victims

Road User Class

The majority of traffic victims were drivers and passengers of vehicles. Pedestrians and motorcyclists accounted for 6.5% and 3.6% of the total casualties, respectively.

Age of Casualties

Casualty rates per 10,000 population were highest for persons between the ages of 15 and 24. The lowest casualty rates were recorded for children 14 and under and people 65 years of age and over.

Table 3.1

Injuries and Fatalities by Road User Class
1990

	Persons Killed		Persons Injured		Total Casualties	
Road User Class	**N**	**%**	**N**	**%**	**N**	**%**
Drivers	201	49.1	10042	54.0	10243	53.9
Passengers	128	31.3	6026	32.4	6154	32.4
Pedestrians	45	11.0	1191	6.4	1236	6.5
Motorcyclists	15	3.7	670	3.6	685	3.6
Bicyclists	10	2.4	617	3.3	627	3.3
Other	5	1.2	37	0.2	42	0.2
Unspecified	5	1.2	21	0.1	26	0.1
Total Casualties	**409**	**100.0**	**18604**	**100.0**	**19013**	**100.0**

Observations

The majority of traffic victims were drivers and passengers of vehicles. Pedestrians and motorcyclists accounted for 6.5% and 3.6% of the total casualties, respectively.

Table 3.2

Age of Casualties
1990

Age In Years	Persons Killed N	Persons Killed %	Persons Injured N	Persons Injured %	Casualty Rate Per 10,000 Population*
Under 5	10	2.4	369	2.0	18.0
5 - 9	9	2.2	662	3.6	34.3
10 - 14	14	3.4	763	4.1	43.7
15 - 19	51	12.5	2987	16.1	168.1
20 - 24	51	12.5	2792	15.0	146.6
25 - 29	51	12.5	2364	12.7	103.6
30 - 34	53	13.0	2008	10.8	85.0
35 - 44	52	12.7	2710	14.6	70.6
45 - 54	24	5.9	1561	8.4	66.4
55 - 64	31	7.6	939	5.0	52.3
65 and over	63	15.4	983	5.3	47.4
Unspecified	-	-	466	2.5	
Total Casualties	**409**	**100.0**	**18604**	**100.0**	

Observations

Casualty rates per 10,000 population were highest for persons between the ages of 15 and 24. The lowest casualty rates were recorded for children (14 years of age and younger) and people 65 and over.

* Based on estimates of the Alberta population by age groups and sex, June 1, 1990, Statistics Canada.

AGE OF CASUALTIES
CASUALTY RATE PER 10,000 POPULATION
Alberta, 1990

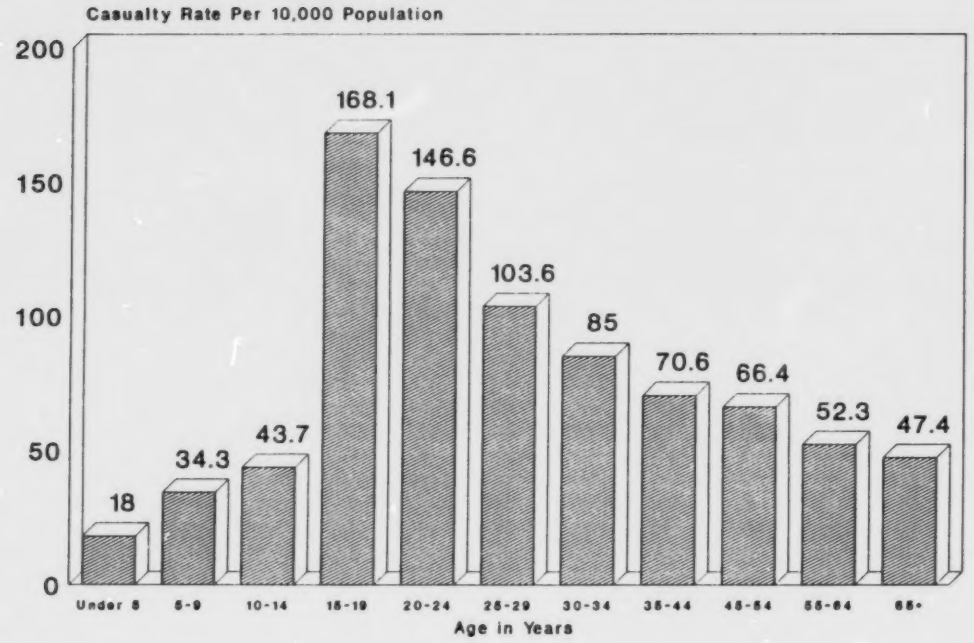


Figure 4

Drivers

Age and Sex of Drivers

Collision rates per 1000 licensed drivers indicated that 16-19 year olds were more likely to be involved in a casualty collision than any other age group.

Driver Actions

Driver error or misjudgment was cited for approximately 53% of the drivers involved in casualty collisions. Following too closely, running off the road, and travelling at an unsafe speed were the most frequent driver actions contributing to casualty collisions.

Table 4.1

**Age and Sex of Drivers Involved in Casualty Collisions:
Per 1,000 Licensed Drivers
1990**

	Males			Females			Total*		
Age of Driver	N	%	Per 1000** Licensed Drivers	N	%	Per 1000** Licensed Drivers	N	%	Per 1000** Licensed Drivers
Under 16	312	1.4	20.3	126	0.6	11.0	438	2.0	16.3
16 - 17	812	3.6	27.7	443	2.0	17.8	1260	5.6	23.2
18 - 19	1101	4.9	29.4	534	2.4	16.5	1639	7.3	23.5
20 - 24	2453	11.0	23.1	1035	4.6	10.7	3496	15.6	17.2
25 - 34	4264	19.0	14.9	2013	9.0	7.8	6286	28.1	11.6
35 - 44	2664	11.9	11.6	1438	6.4	7.2	4107	18.3	9.5
45 - 54	1450	6.5	11.0	722	3.2	6.5	2174	9.7	8.9
55 - 64	955	4.3	9.8	371	1.7	5.1	1328	5.9	7.8
65 and over	812	3.6	9.7	291	1.3	5.2	1104	4.9	8.0
Unspecified	143	0.6		58	0.3		556	2.5	
TOTAL Number of Drivers	**14966**	**66.8**		**7031**	**31.4**		**22388**	**100.0**	

Observations

Collision rates per 1000 licensed drivers indicated that 18-19 year olds were more likely to be involved in a casualty collision than any other age group. The next age group most likely to be involved in casualty crashes was 16 to 17 year olds.

*Total includes drivers whose sex was not specified on the collision report form.

**Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics, December 31, 1990.

AGE AND SEX OF DRIVERS INVOLVED IN
CASUALTY COLLISIONS, Alberta 1990
COLLISION RATE PER 1000 LICENSED DRIVERS

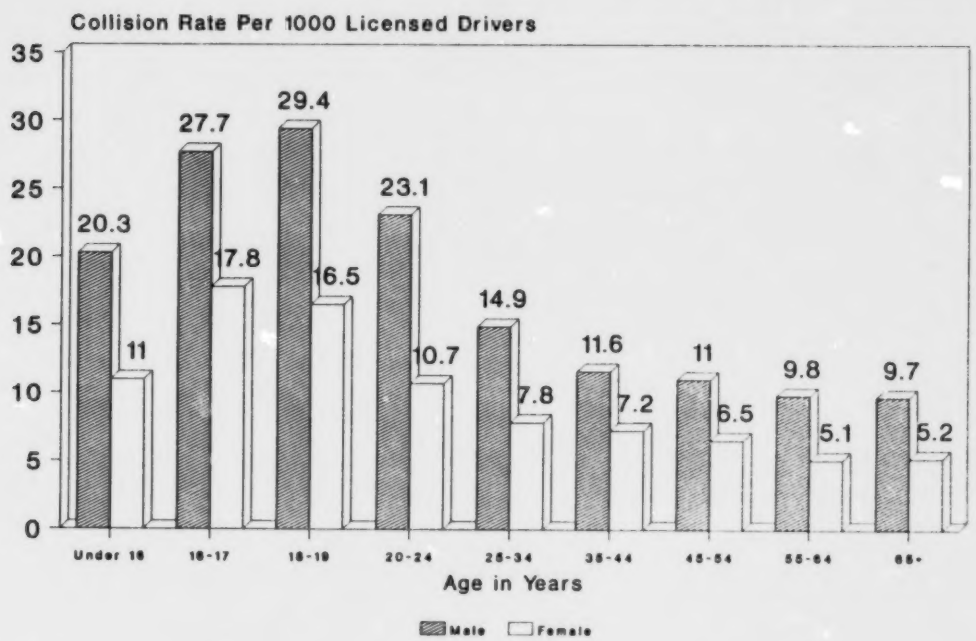


Figure 5

Table 4.2

**Actions of Drivers Involved in Casualty Collisions*
1990**

Driver Action	Drivers in Fatal Collisions		Drivers in Non-Fatal Injury Collisions		Total Drivers in Casualty Collisions	
	N	%	N	%	N	%
Driving Properly	242	43.0	9749	47.1	9991	47.0
Following Too Closely	2	0.4	1503	7.3	1505	7.1
Ran Off Road	77	13.7	1255	6.1	1332	6.3
Unsafe Speed	30	5.3	1261	6.1	1291	6.1
Failed to Observe Traffic Control Device	46	8.2	1167	5.6	1213	5.7
Left Turn Across Path	16	2.8	1017	4.9	1033	4.9
Failed to Yield Right-of-Way	29	5.2	941	4.5	970	4.6
Entered Lane When Unsafe	3	0.5	406	2.0	409	1.9
Left of Center	70	12.4	265	1.3	335	1.6
Improper Turn	5	0.9	274	1.3	279	1.3
Backed Unsafely	3	0.5	149	0.7	152	0.7
Improper Passing	8	1.4	133	0.6	141	0.7
Failed to Signal	-	-	15	0.1	15	0.1
Other	32	5.7	2579	12.5	2611	12.3
Total Number of Drivers	**563**	**100.0**	**20714**	**100.0**	**21277**	**100.0**

Observations

Driver error or misjudgment was cited for approximately 53% of drivers involved in casualty collisions. Following too closely, running off the road, and travelling at an unsafe speed were the most frequently identified driver actions contributing to casualty collisions.

*Based on those cases where driver action was specified on the collision report form.

Vehicles

Types of Vehicles

Passenger cars and pickup trucks/vans were the vehicles most frequently involved in total casualty collisions. Motorcycles were involved in 2.8% of casualty collisions and bicycles were involved in 2.7% of casualty collisions.

Vehicular Factors

Less than 2% of vehicles involved in casualty collisions were identified as having a vehicle defect. The most common defects involved tire failure and defective brakes.

Point of Impact

The most common point of impact in casualty collisions involved the front of the vehicle. Approximately 39.5% of the impacts involved the center front.

Table 5.1

**Types of Vehicles Involved in Casualty Collisions*
1990**

Type of Vehicle	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
Passenger Car	276	46.9	14107	63.2	14383	62.7
Pickup Truck / Van	203	34.5	5794	25.9	5997	26.2
Motorcycle	16	2.7	619	2.8	635	2.8
Bicycle	12	2.0	609	2.7	621	2.7
Truck 4000kg+	33	5.6	493	2.2	526	2.3
Tractor - Trailer	39	6.6	422	1.9	461	2.0
Other Bus	1	0.2	129	0.6	130	0.6
School Bus	1	0.2	40	0.2	41	0.2
Off Highway Vehicle	4	0.7	30	0.1	34	0.1
Farm Equipment	1	0.2	20	0.1	21	0.1
Other	3	0.5	74	0.3	77	0.3
Total Number of Vehicles	**589**	**100.0**	**22337**	**100.0**	**22926**	**100.0**

Observations

Passenger cars and pickup trucks/vans were the vehicles most frequently involved in total casualty collisions. Overall, motorcycles were involved in 2.8% and bicycles in 2.7% of casualty collisions. Tractor-trailers were involved in 2.0% of total casualty crashes, but in 6.6% of fatal crashes.

* Based on those cases where type of vehicle was specified on the collision report form.

Table 5.2

Vehicular Factors Involved in Casualty Collisions*
1990

Vehicular Factors	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
No Defect Present	447	94.7	19904	98.3	20351	98.2
Tire Failure/Inadequate	4	0.8	82	0.4	86	0.4
Defective Brakes	10	2.1	72	0.4	82	0.4
Lighting Defect	2	0.4	46	0.2	48	0.2
Other	9	1.9	154	0.8	163	0.8
Total Number of Vehicles	**472**	**100.0**	**20258**	**100.0**	**20730**	**100.0**

Observations

Less than 2% of vehicles involved in casualty collisions were identified as having a vehicle defect. The most common defects included tire failure and defective brakes.

* Based on those cases where a vehicle factor was specified on the collision report form.

Table 5.3

**Point of Impact on Vehicles Involved in Casualty Collisions*
1990**

Point of Impact	Vehicles in Fatal Collisions		Vehicles in Non-Fatal Injury Collisions		Total Vehicles in Casualty Collisions	
	N	%	N	%	N	%
Center Front	265	46.7	8266	39.3	8531	39.5
Right Front	29	5.1	1827	8.7	1856	8.6
Left Front	43	7.6	2017	9.6	2060	9.5
Right Side	53	9.3	1221	5.8	1274	5.9
Left Side	60	10.6	1196	5.7	1256	5.8
Center Rear	20	3.5	3322	15.8	3342	15.5
Right Rear	8	1.4	685	3.3	693	3.2
Left Rear	11	1.9	633	3.0	644	3.0
Top	1	0.2	30	0.1	31	0.1
Undercarriage	2	0.4	126	0.6	128	0.6
Rollover	76	13.4	1688	8.0	1764	8.2
Total Number of Vehicles	**568**	**100.0**	**21011**	**100.0**	**21579**	**100.0**

Observations

The most common point of impact in casualty collisions involved the front of the vehicle. Approximately 39.5% of the impacts involved the center front, while 15.5% of the impacts involved the center rear.

*Based on those cases for which the point of impact was specified on the collision report form.

Environment

Location

The majority of fatal crashes occurred in rural areas, whereas the majority of injury and property damage only crashes occurred in urban areas.

Surface Condition

The majority (56.8%) of casualty collisions occurred when surface conditions were dry. Snow/ice were present in 21.0% of the casualty crashes.

Road Location

Approximately 47.4% of casualty collisions were intersection-related. However, fatal collisions were more likely to be non-intersection related (59.9%).

Table 6.1

Location of Collisions
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Property Damage Only Collisions		Total Collisions	
Location	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Urban	113	31.7	9257	73.4	87848	82.2	97218	81.1
Rural	244	68.3	3362	26.6	19071	17.8	22677	18.9
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**106919**	**100.0**	**119895**	**100.0**

Observations

Collisions which occurred in rural areas accounted for 68.3% of all fatal crashes. Collisions occurring in urban areas resulted in the highest proportion of non-fatal injury collisions (73.4%) and property damage only crashes (82.2%).

Table 6.2

Casualty Collision Occurrence by Surface Condition
1990

Surface Condition	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
	N	%	N	%	N	%
Dry	213	59.7	7161	56.7	7374	56.8
Snowy/Icy	70	19.6	2659	21.1	2729	21.0
Wet	32	9.0	1249	9.9	1281	9.9
Loose Material	35	9.8	720	5.7	755	5.8
Other	2	0.6	34	0.3	36	0.3
Unspecified	5	1.4	796	6.3	801	6.2
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**12976**	**100.0**

Observations

The majority of casualty collisions occurred when surface conditions were dry. Snow and ice were involved in 19.6% of fatal collisions and 21.1% of non-fatal injury collisions.

Table 6.3

Road Location of Casualty Collisions
1990

Road Location	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
	N	%	N	%	N	%
Intersection Related	109	30.5	6039	47.9	6148	47.4
Non-Intersection Related	214	59.9	5517	43.7	5731	44.2
At/Near Entrance to Private Property	20	5.6	324	2.6	344	2.7
Parking Lot	-	-	307	2.4	307	2.4
At/Near Commercial Entrance	5	1.4	240	1.9	245	1.9
At/Near Service Road	2	0.6	88	0.7	90	0.7
At/Near Railroad Crossing	7	2.0	54	0.4	61	0.5
Off Highway	-	-	29	0.2	29	0.2
Unspecified	-	-	21	0.2	21	0.2
Total Number of Collisions	**357**	**100.0**	**12619**	**100.0**	**12976**	**100.0**

Observations

47.4% of casualty collisions were intersection-related. Fatal collisions were more likely to be non-intersection related (59.9%).

Special Types of Vehicles

Motorcycles

- Based on motorcycle registrations, the involvement rate of motorcycles in casualty collisions increased from 1989.
- The majority of motorcycle casualty collisions involved male drivers. Motorcycle drivers under the age of 25 had the highest involvement rate per 1000 licensed drivers. In particular 16 and 17 year old motorcycle drivers had an involvement rate per 1,000 licensed drivers of 88.8, a rate over six and a half times greater than that of the 20-24 year old motorcycle drivers.
- Compared to drivers involved in total casualty collisions, motorcycle drivers were more likely to drive at an unsafe speed, run off the road, or pass improperly. However, motorcycle drivers were less likely to make a left turn across the path of an oncoming vehicle, follow too closely or fail to observe a traffic control device.
- Compared to drivers involved in all types of vehicle casualty collisions, motorcycle drivers were more likely to have consumed alcohol before the crash.
- Vehicular factors were involved in 5.1% of motorcycle casualty collisions compared to 1.8% of casualty collisions involving all types of vehicles.
- The majority of casualty collisions involving motorcycles occurred on dry roads.

Table 7.1

Casualty Collisions Involving Motorcycles
1986-1990

Number Of Motorcycles	**1990**	**1989**	**1988**	**1987**	**1986**
Fatal	16	12	31	31	33
Non-Fatal Injury	619	586	774	861	989
Total Number of Motorcycles	**635**	**598**	**805**	**892**	**1022**
Casualties*					
Number Killed	15	11	31	32	33
Number Injured	729	675	925	1029	1156
Total Casualties in Collisions Involving Motorcycles	**744**	**686**	**956**	**1061**	**1189**
Number of Motorcycles Involved in Casualty Collisions Per 10,000 Registered Motorcycles **					
Fatal Collisions	4.2	3.2	7.3	6.8	7.1
Non-Fatal Injury Collisions	162.1	154.8	182.2	190.0	212.7

Observations

Based on motorcycle registrations, the involvement rate of motorcycles in casualty collisions increased in 1990 after a five year low in 1989.

* This refers to the total number of people killed and injured in collisions in which a motorcycle was involved. It does not refer to the number of motorcyclists killed and injured.

** Source: Based on vehicle registration statistics, Motor Vehicles Division, Alberta Solicitor General, March 31, 1990.

NUMBER OF MOTORCYCLES INVOLVED IN
FATAL COLLISIONS, Alberta 1986-1990
RATE PER 10,000 REGISTERED MOTORCYCLES

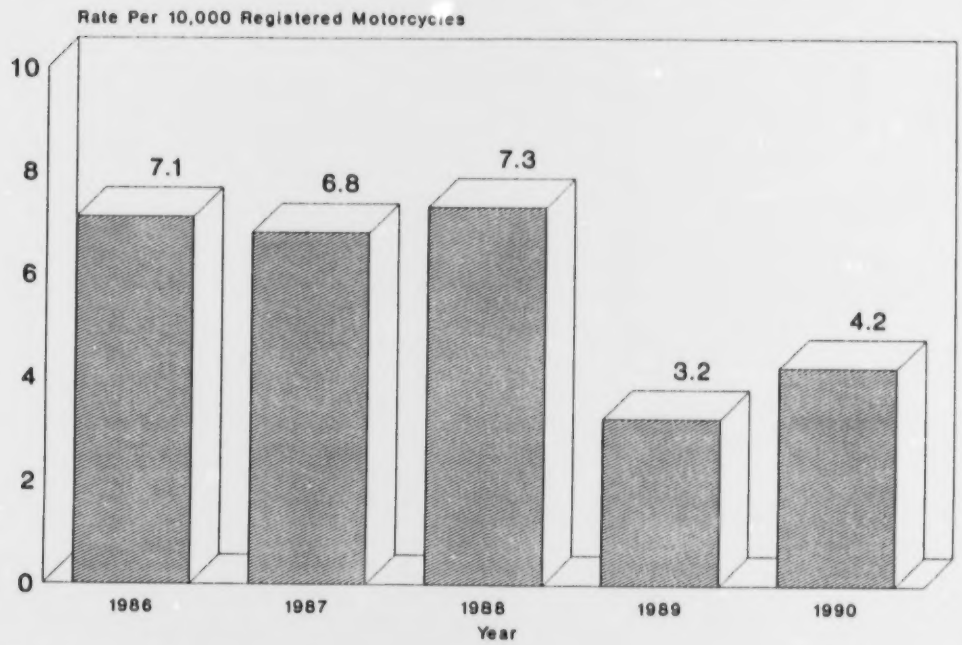


Figure 6

Table 7.2

**Casualty Collisions Involving Motorcycles:
Age and Sex of Motorcycle Driver
1990**

Age of Motorcycle Driver	Male		Female		Total*		Rate Per 1,000 Licensed Motorcycle Drivers**
	N	%	N	%	N	%	
Under 16	23	3.6	4	0.6	27	4.3	
16 - 17	39	6.1	-	-	39	6.1	88.8
18 - 19	87	13.7	-	-	89	14.0	55.0
20 - 24	154	24.3	7	1.1	163	25.7	13.6
25 - 34	183	28.8	9	1.4	193	30.4	3.2
35 - 44	86	13.5	2	0.3	88	13.9	1.7
45 - 54	21	3.3	3	0.5	24	3.8	1.5
55 - 64	4	0.6	-	-	4	0.6	0.5
65 and over	2	0.3	-	-	2	0.3	0.8
Unspecified	1	0.2	-	-	6	0.9	
Total Number of Motorcycle Drivers	**600**	**94.5**	**25**	**3.9**	**635**	**100.0**	

Observations

The majority of motorcycle casualty collisions involved male drivers. Motorcycle drivers under the age of 25 were most likely to be involved in collisions. In particular, 16 and 17 year old motorcycle drivers had the highest involvement rate per 1000 licensed motorcyclists. The age group least likely to be involved in collisions were motorcyclists 55 years of age and over. These age and sex comparisons are limited due to the lack of driving exposure data. That is, in order to make valid age comparisons, it is important to take into account the number of kilometres driven annually by each age and sex group of motorcycle operators.

Note: In Alberta, Class 6 (motorcycle) licenses are not issued to operators under 16 years of age.

* Total includes drivers whose sex was not specified on the collision report form.
** Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics,

Table 7.3

Casualty Collisions Involving Motorcycles: Action of Motorcycle Driver* 1990

Action of Motorcycle Driver	N	%	Driver Action in Total Casualty Collisions (All Vehicle Types) %
Driving Properly	246	41.7	47.0
Unsafe Speed	91	15.4	6.1
Ran Off Road	63	10.7	6.3
Followed Too Closely	22	3.7	7.1
Improper Passing	16	2.7	0.7
Failed to Observe Traffic Control Device	15	2.5	5.7
Failed to Yield Right of Way	9	1.5	4.6
Left Turn Across Path	8	1.4	4.9
Left of Centre	6	1.0	1.6
Entered Lane When Unsafe	5	0.8	1.9
Improper Turn	5	0.8	1.3
Other	104	17.6	12.3
Total Number of Motorcycle Drivers	**590**	**100.0**	

Observations

Improper driver actions were a contributory factor for 58.3% of the motorcyclists involved in casualty collisions. Compared to drivers involved in total casualty collisions, motorcycle drivers were more likely to drive at an unsafe speed, run off the road, or pass improperly. However, motorcycle drivers were less likely to make a left turn across the path of an oncoming vehicle, follow too closely or fail to observe a traffic control device.

* Based on those cases where driver action was specified on the collision report form.

Table 7.4

**Casualty Collisions Involving Motorcycles:
Condition of Motorcycle Driver***
1990

Condition of Motorcycle Driver	N	%	Driver Condition in Total Casualty Collisions (All Vehicle Types) %
Normal	457	78.5	88.6
Had Been Drinking	72	12.4	5.3
Alcohol Impaired	46	7.9	4.4
Other	7	1.2	1.6
Total Number of Motorcycle Drivers	**582**	**100.0**	

Observations

The motorcycle driver's condition was a contributory factor for 21.5% of these crashes. Compared to drivers involved in other types of vehicle casualty collisions, motorcycle drivers were more likely to have consumed alcohol prior to the crash.

* Based on those cases where driver condition was specified on the collision report form.

Table 7.5

**Casualty Collisions Involving Motorcycles:
Vehicular Factors***
1990

Vehicular Factors	N	%	Vehicular Factors in Total Casualty Collisions (All Vehicle Types) %
No Defect Present	544	94.9	98.2
Tire Failure/Inadequate	5	0.9	0.4
Defective Brakes	3	0.5	0.4
Lighting Defect	3	0.5	0.2
Other	18	3.1	0.8
Total Number of Motorcycles	**573**	**100.0**	

Observations

Vehicular factors were involved in 5.1% of motorcycle casualty collisions, compared to 1.8% in casualty collisions involving other types of vehicles. In particular, motorcycles were over two and a half times as likely as other vehicle types to be recorded as having a lighting defect.

* Based on those cases where a vehicular factor was specified on the collision report form.

Table 7.6

Casualty Collisions Involving Motorcycles:
Month of Occurrence
1990

Month	N	%
January	-	-
February	1	0.2
March	14	2.3
April	40	6.5
May	95	15.5
June	128	20.9
July	117	19.1
August	97	15.8
September	93	15.2
October	23	3.8
November	3	0.5
December	1	0.2
Total Number of Collisions	**612**	**100.0**

Observations

The months of May to September recorded the highest proportion of casualty crashes involving motorcycles.

Table 7.7

Casualty Collisions Involving Motorcycles:
Road Surface Condition*
1990

Road Surface Condition	N	%
Dry	499	85.6
Loose Material	50	8.6
Wet	28	4.8
Snowy/Icy	-	-
Other	6	1.0
Total Number of Collisions	**583**	**100.0**

Observations

The majority of casualty collisions involving motorcycles occurred on dry roads. Loose material on the road surface was involved in 8.6% of motorcycle casualty crashes.

* Based on those cases where road surface condition was specified on the collision report form.

Special Types of Vehicles

Tractor-Trailers

- In 1990, there were 50 persons killed and 577 injured in collisions involving tractor-trailers. This represents an increase in casualties from 1989.
- Compared to drivers of other vehicles, tractor-trailer drivers were more likely to run off the road, enter a lane when unsafe, or pass improperly. However, operators of tractor-trailers were less likely than other vehicle operators to make an unsafe left turn or fail to yield the right-of-way.
- Tractor-trailer drivers were less likely to consume alcohol before the crash than were drivers in total casualty collisions.
- Vehicular factors were more likely to be present in tractor-trailer casualty collisions than in total casualty collisions.
- The occurrence of casualty collisions involving tractor-trailers was highest in the months of February, July, September, and November.

Table 7.8

Casualty Collisions Involving Tractor-Trailers
1986-1990

Number of Tractor-Trailers	1990	1989	1988	1987	1986
Fatal	39	51	41	55	53
Non-Fatal Injury	422	383	392	359	425
Total Number of Tractor-Trailers	**461**	**434**	**433**	**414**	**478**
Casualties*					
Number Killed	50	58	52	63	65
Number Injured	577	555	569	529	607
Total Casualties in Collisions	**627**	**613**	**621**	**592**	**672**

Observations

In 1990, there were 50 persons killed and 577 injured in collisions involving tractor-trailers. This represents an increase in casualties from 1989. The total number of tractor-trailers involved in casualty crashes increased in 1990, standing at 461 compared to the five-year high of 478 recorded in 1986.

* This refers to the total number of people killed and injured in collisions in which a tractor-trailer was involved. It does not refer to the number of tractor-trailer drivers killed and injured.

Table 7.9

Casualty Collisions Involving Tractor-Trailers:
Driver Action*
1990

Driver Action	N	%	Driver Action In Total Casualty Collisions (All Types of Vehicles) %
Driving Properly	218	52.2	47.0
Ran Off Road	47	11.2	6.3
Unsafe Speed	28	6.7	6.1
Followed Too Closely	21	5.0	7.1
Failed to Observe Traffic Control Device	17	4.1	5.7
Entered Lane When Unsafe	11	2.6	1.9
Failed to Yield Right-of-Way	8	1.9	4.6
Improper Passing	8	1.9	0.7
Left of Center	7	1.7	1.6
Left Turn Across Path	6	1.4	4.9
Improper Turn	2	0.5	1.3
Backed Unsafely	1	0.2	0.7
Other	44	10.5	12.3
Total Number of Drivers	**418**	**100.0**	

Observations

Improper driver actions were exhibited by approximately 47.8% of the tractor-trailer drivers involved in casualty collisions. Compared to drivers of other vehicles, tractor-trailer drivers were more likely to run off the road, enter a lane when unsafe, or pass improperly. However, operators of tractor-trailers were less likely than other vehicle operators to make an unsafe left turn or fail to yield the right-of-way.

* Based on those cases where driver action was specified on the collision report form.

Table 7.10

Casualty Collisions Involving Tractor-Trailers: Driver Condition* 1990

Driver Condition	N	%	Driver Condition in Total Casualty Collisions (All Vehicle Types) %
Normal	395	96.3	88.6
Had Been Drinking	2	0.5	5.3
Alcohol Impaired	5	1.2	4.4
Other	8	2.0	1.6
Total Number of Drivers	**410**	**100.0**	

Observations

The condition of the tractor-trailer driver was a contributory factor for only 3.7% of the drivers involved. Tractor-trailer drivers were less likely to consume alcohol before the crash than were drivers involved in total casualty collisions.

* Based on those cases where driver condition was specified on the collision report form.

Table 7.11

**Casualty Collisions Involving Tractor-Trailers:
Vehicular Factors***
1990

Vehicular Factors	N	%	Vehicular Factors in Total Casualty Collisions (All Vehicle Types) %
No Defect Present	380	95.0	98.2
Defective Brakes	9	2.3	0.4
Tire Failure/Inadequate	5	1.3	0.4
Lighting Defect	1	0.3	0.2
Other	5	1.3	0.8
Total Number of Tractor-Trailers	**400**	**100.0**	

Observations

Vehicular factors were involved in 5.0% of tractor-trailer casualty collisions. Vehicular factors were more likely to be present in tractor-trailer collisions than in total casualty collisions.

* Based on those cases where a vehicular factor was specified on the collision report form.

Table 7.12

Casualty Collisions Involving Tractor-Trailers:
Month of Occurrence
1990

Month	N	%
January	34	8.1
February	46	10.9
March	30	7.1
April	25	5.9
May	17	4.0
June	30	7.1
July	42	10.0
August	35	8.3
September	44	10.4
October	25	5.9
November	53	12.6
December	41	9.7
Total Number of Collisions	**422**	**100.0**

Observations

The occurrence of casualty collisions involving tractor-trailers was highest in the months of February, July, September, and November. The lowest number of tractor-trailer casualty collisions occurred during May.

Special Types of Vehicles

Trains

- In 1990, 6 people were killed and 32 people were injured in crashes in which a train was involved. The number of casualties involving trains has decreased from 1989.
- The largest number of casualty collisions involving trains occurred in the month of December.
- A large percentage of drivers involved in a collision with a train failed to observe the traffic control device (59.3%).

Table 7.13

Casualty Collisions Involving Trains
1986-1990

Number of Trains	1990	1989	1988	1987	1986
Fatal	6	15	8	4	3
Non-Fatal Injury	24	29	31	31	22
Total Number of Trains	**30**	**44**	**39**	**35**	**25**
Casualties*					
Number Killed	6	20	11	4	3
Number Injured	32	43	43	42	30
Total Casualties in Collisions Involving Trains	**38**	**63**	**54**	**46**	**33**

Observations

The number of trains involved in casualty collisions decreased from 1989. The number of casualties resulting from these collisions has also decreased since 1989.

* This refers to the total number of people killed and injured in collisions involving a train.

Table 7.14

Casualty Collisions Involving Trains:
Month of Occurrence
1990

Month	Fatal Collisions N	Fatal Collisions %	Non-Fatal Injury Collisions N	Non-Fatal Injury Collisions %	Total Casualty Collisions N	Total Casualty Collisions %
January	1	16.7	3	12.5	4	13.3
February	-	-	3	12.5	3	10.0
March	2	33.3	-	-	2	6.7
April	-	-	2	8.3	2	6.7
May	-	-	-	-	-	-
June	2	33.3	1	4.2	3	10.0
July	-	-	1	4.2	1	3.3
August	1	16.7	4	16.7	5	16.7
September	-	-	1	4.2	1	3.3
October	-	-	1	4.2	1	3.3
November	-	-	2	8.3	2	6.7
December	-	-	6	25.0	6	20.0
Total Number of Collisions	**6**	**100.0**	**24**	**100.0**	**30**	**100.0**

Observations

The largest number of casualty collisions involving trains occurred in the month of December.

Table 7.15

Casualty Collisions Involving Trains:
Driver Action*
1990

	Drivers in Fatal Collisions		Drivers In Non-Fatal Injury Collisions		Total Drivers in Casualty Collisions	
Driver Action	**N**	**%**	**N**	**%**	**N**	**%**
Failed to Observe Traffic Control Device	4	66.7	12	57.1	16	59.3
Unsafe Speed	-	-	4	19.0	4	14.8
Failed to Yield Right-of-Way	1	16.7	2	9.5	3	11.1
Backed Unsafely	1	16.7	-	-	1	3.7
Other	-	-	3	14.3	3	11.1
Total Number of Drivers	**6**	**100.0**	**21**	**100.0**	**27**	**100.0**

Observations

A large percentage of drivers involved in collision with a train failed to observe the traffic control device (59.3%).

* Based on those cases where driver action was specified on the collision report form.

Pedestrians

- Pedestrian casualty collisions were fairly evenly distributed across all months of the year. September and November accounted for the largest number of collisions, while April experienced the least number of pedestrian crashes.
- Pedestrian casualty collisions were most likely to occur on Fridays and least likely to occur on Sundays.
- Pedestrian casualty collisions were most likely to occur during the evening rush-hour period. (3:00 p.m. to 6:59 p.m.).
- 28.1% of the drivers in collisions involving a pedestrian were recorded as failing to yield the right-of-way.
- The casualty rate per population was highest for pedestrians between the ages of 5 and 19.

Table 8.1

Casualty Collisions Involving Pedestrians:
Month of Occurrence
1990

Month of Collision	N	%
January	88	7.7
February	86	7.5
March	93	8.1
April	79	6.9
May	91	7.9
June	89	7.8
July	91	7.9
August	85	7.4
September	123	10.7
October	102	8.9
November	120	10.5
December	101	8.8
Total Number of Collisions	**1148**	**100.0**

Observations

Pedestrian casualty collisions were fairly evenly distributed across all months of the year. September and November accounted for the largest number of collisions, while April experienced the least number of pedestrian crashes.

Table 8.2

Casualty Collisions Involving Pedestrians:
Day of Week
1990

Day of Week	N	%
Monday	145	12.6
Tuesday	174	15.2
Wednesday	159	13.9
Thursday	178	15.5
Friday	222	19.3
Saturday	155	13.5
Sunday	115	10.0
Total Number of Collisions	**1148**	**100.0**

Observations

Pedestrian casualty collisions were most likely to occur on Fridays and least likely to occur on Sundays.

Table 8.3

Casualty Collisions Involving Pedestrians:
Time Period
1990

Time Period	N	%
11:00 p.m. - 2:59 a.m.	110	9.6
3:00 a.m. - 6:59 a.m.	39	3.4
7:00 a.m. - 10:59 a.m.	174	15.2
11:00 a.m. - 2:59 p.m.	247	21.5
3:00 p.m. - 6:59 p.m.	357	31.1
7:00 p.m. - 10:59 p.m.	202	17.6
Unspecified	19	1.7
Total Number of Collisions	**1148**	**100.0**

Observations

Pedestrian casualty collisions were most likely to occur during the evening rush-hour period from 3:00 p.m. to 6:59 p.m. These collisions were least likely to occur during the early morning hours.

Table 8.4

Casualty Collisions Involving Pedestrians:
Location
1990

Location	N	%
Urban	1067	92.9
Rural	81	7.1
Total Number of Collisions	**1148**	**100.0**

Observations

The majority of pedestrian casualty collisions (92.9%) occurred in urban areas. Only 7.1% occurred in rural areas.

Table 8.5

Casualty Collisions Involving Pedestrians:
Driver Action
1990

Driver Action	N	%	Driver Action in Total Casualty Collisions (All Vehicle Types) %
Driving Properly	481	54.1	47.0
Failed to Yield Right-of-Way	250	28.1	4.6
Backed Unsafely	52	5.8	0.7
Unsafe Speed	34	3.8	6.1
Failed to Observe Traffic Control Device	23	2.6	5.7
Ran Off Road	10	1.1	6.3
Left of Center	9	1.0	1.6
Improper Turn	8	0.9	1.3
Improper Passing	7	0.8	0.7
Entered Lane When Unsafe	6	0.7	1.9
Followed Too Closely	5	0.6	7.1
Left Turn Across Path	4	0.4	4.9
Other	185	20.8	12.3
Total Number of Drivers	**889**	**100.0**	

Observations

54.1% of the drivers involved in pedestrian crashes were recorded as driving properly. However, compared to total casualty collisions, drivers involved in pedestrian casualty collisions were over six times as likely to fail to yield right of way (28.1%).

* Based on those cases where a driver action was specified on the collision report form.

Table 8.6

Age of Pedestrian Casualties
1990

Age in Years	Pedestrians Killed N	Pedestrians Injured N	Total Pedestrian Casualties N	%	Pedestrian Casualty Rate Per 10,000 Population
Under 5	3	55	58	4.9	2.9
5 - 9	3	136	139	13.1	8.4
10 - 14	2	134	136	10.6	7.5
15 - 19	5	135	140	14.5	10.0
20 - 24	5	117	122	10.2	6.5
25 - 29	4	102	106	8.6	4.6
30 - 34	5	96	101	7.7	4.0
35 - 44	2	117	119	8.2	2.6
45 - 54	4	92	96	6.4	3.4
55 - 64	5	63	68	5.5	3.7
65 and over	7	108	115	8.7	4.9
Unspecified	-	36	36	1.7	
Total Number of Pedestrian Casualties	**45**	**1191**	**1236**	**100.0**	

Observations

The casualty rate per population was highest for pedestrians between the ages of 5 and 19. In particular, pedestrians aged 15 to 19 had the highest casualty rate. The lowest casualty rate was recorded for persons aged 35 to 44 years. The greatest number of fatalities was in the age group 65 and over.

*Source - Based on estimates of the Alberta population by age groups and sex, June 1, 1990, Statistics Canada.

PEDESTRIAN CASUALTIES
CASUALTY RATE PER 10,000 POPULATION
Alberta, 1990

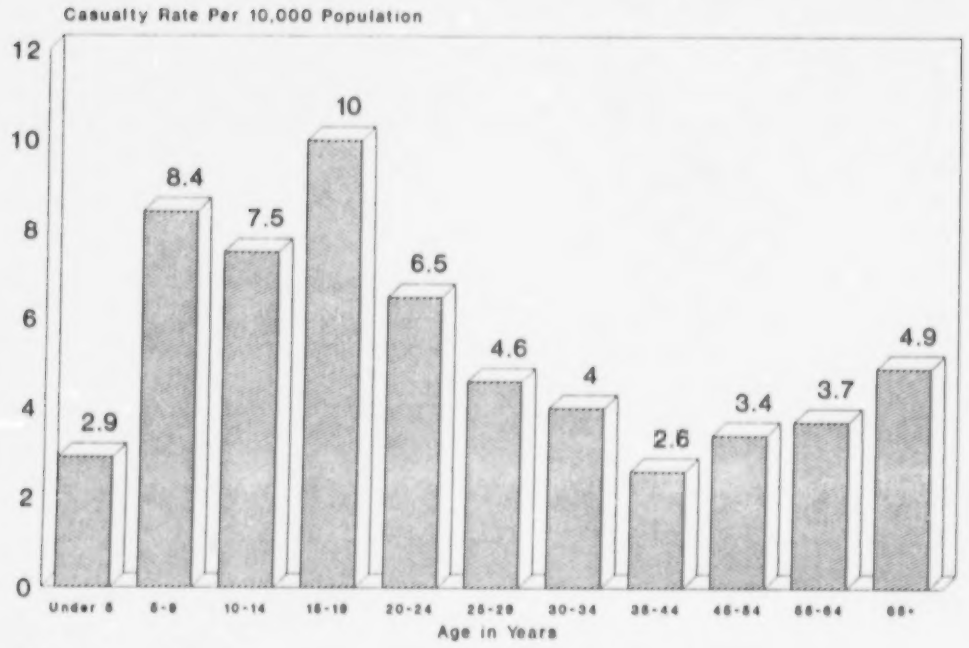


Figure 7

Bicyclists

- Casualty collisions involving bicycles were more likely to occur between the months of May and September.
- Weekdays experienced the most casualty collisions involving bicycles. As well, the largest number of these crashes (42.0%) occurred during the evening rush-hour period.
- Young bicyclists, 10-14 years of age, were the group most frequently involved in bicycle casualty crashes.
- An improper action on the part of the bicyclist was recorded for approximately 65% of those involved in casualty crashes. Compared to operators of all vehicles in casualty collisions, bicyclists were more likely to fail to yield right-of-way or enter a lane when unsafe.

Table 9.1

Casualty Collisions Involving Bicycles:
Month of Occurrence
1990

Month	N	%
January	7	1.1
February	4	0.7
March	29	4.8
April	44	7.2
May	63	10.3
June	101	16.6
July	106	17.4
August	85	13.9
September	107	17.5
October	47	7.7
November	15	2.5
December	2	0.3
Total Number Of Collisions	**610**	**100.0**

Observations

The majority of casualty crashes involving bicycles occurred during the months of May to September.

Table 9.2

Casualty Collisions Involving Bicycles:
Day of Week
1990

Day of Week	N	%
Monday	91	14.9
Tuesday	109	17.9
Wednesday	108	17.7
Thursday	100	16.4
Friday	95	15.6
Saturday	62	10.2
Sunday	45	7.4
Total Number of Collisions	**610**	**100.0**

Observations

Casualty collisions involving bicycles were more likely to occur on weekdays.

Table 9.3

Casualty Collisions Involving Bicycles:
Time Period
1990

Time Period	N	%
11:00 p.m. - 2:59 a.m.	17	2.8
3:00 a.m. - 6:59 a.m.	5	0.8
7:00 a.m. - 10:59 a.m.	87	14.3
11:00 a.m. - 2:59 p.m.	120	19.7
3:00 p.m. - 6:59 p.m.	256	42.0
7:00 p.m. - 10:59 p.m.	119	19.5
Unspecified	6	1.0
Total Number of Collisions	**610**	**100.0**

Observations

The largest proportion of casualty crashes (42.0%) involving bicycles occurred during the evening rush-hour period of 3:00 p.m. - 6:59 p.m.

Table 9.4

Casualty Collisions Involving Bicycles:
Age and Sex of Bicyclist Casualties
1990

Age of Bicyclist	Male		Female		Total*	
	N	%	N	%	N	%
Under 5	7	1.1	2	0.3	9	1.4
5 - 9	89	14.2	30	4.8	119	19.0
10 - 14	105	16.7	47	7.5	152	24.2
15 - 19	80	12.8	28	4.5	109	17.4
20 - 24	61	9.7	27	4.3	88	14.0
25 - 29	28	4.5	11	1.8	39	6.2
30 - 34	26	4.1	19	3.0	45	7.2
35 - 44	26	4.1	9	1.4	35	5.6
45 - 54	10	1.6	3	0.5	13	2.1
55 - 64	4	0.6	1	0.2	5	0.8
65 and over	3	0.5	-	-	3	0.5
Unspecified	5	0.8	4	0.6	10	1.6
Total Number of Bicyclist Casualties	**444**	**70.8**	**181**	**28.9**	**627**	**100.0**

Observations

The majority of bicycle casualty collisions involved male bicyclists. The 10-14 year old age group was most frequently involved in these collisions.

* Total includes bicyclists whose sex was not specified on the collision report form.

Table 9.5

Casualty Collisions Involving Bicycles:
Action of Bicyclist*
1990

Action of Bicyclist	N	%	Driver Action In Total Casualty Collisions (All Vehicle Types) %
Driving Properly	204	34.8	47.0
Failed to Yield Right-of-Way	72	12.3	4.6
Failed to Observe Traffic Control Device	36	6.1	5.7
Entered Lane When Unsafe	33	5.6	1.9
Left of Center	20	3.4	1.6
Left Turn Across Path	16	2.7	4.9
Unsafe Speed	9	1.5	6.1
Followed Too Closely	6	1.0	7.1
Improper Turn	5	0.9	1.3
Improper Passing	4	0.7	0.7
Failed to Signal	2	0.3	0.1
Backed Unsafely	1	0.2	0.7
Ran Off Road	1	0.2	6.3
Other	177	30.2	12.3
Total Number of Bicyclists	**586**	**100.0**	

Observations

An improper action on the part of the bicyclist was recorded for approximately 65% of those involved in casualty crashes. Compared to operators of all vehicles in casualty collisions, bicyclists were more likely to fail to yield right-of-way or enter a lane when unsafe.

* Based on those cases where driver action was specified on the collision report form.

Traffic Safety Issues

Alcohol Involvement

- A total of 9.4% of drivers involved in injury crashes were judged to have consumed alcohol prior to the crash, compared to 22.1% of drivers involved in fatal collisions. As the severity of the collision increased, the involvement of alcohol dramatically increased.

- In terms of involvement per 1,000 licensed drivers, males between 18 and 21 years of age were most likely to have been drinking before the crash. There were over six times as many male drivers as female drivers who had consumed alcohol prior to the collision.

- In 1990, alcohol related casualty crashes were most likely to have occurred between May to September, on Saturday, and between 11:00 p.m. and 2:59 a.m.

- Figure 8 provides a graphic representation of the involvement of drinking drivers in casualty collisions over the past five years, 1986-1990.

Table 10.1

Condition of Drivers in Casualty Collisions*
1990

	Drivers in Fatal Collisions		Drivers in Non-Fatal Injury Collisions		Total Drivers in Casualty Collisions	
Condition of Driver	**N**	**%**	**N**	**%**	**N**	**%**
Normal	386	76.7	17785	88.9	18171	88.6
Had Been Drinking	71	14.1	1024	5.1	1095	5.3
Alcohol Impaired	40	8.0	857	4.3	897	4.4
Total Alcohol Involvement	**111**	**22.1**	**1881**	**9.4**	**1992**	**9.7**
Other	6	1.2	331	1.7	337	1.6
Total Number of Drivers	**503**	**100.0**	**19997**	**100.0**	**20500**	**100.0**

Observations

Of drivers involved in injury collisions, 9.4% had consumed alcohol before the crash, compared to 22.1% in fatal collisions. As the severity of the collision increased, the involvement of alcohol dramatically increased. Overall, 9.7% of drivers involved in casualty collisions were judged to have consumed alcohol before the crash.

* Based on those cases where driver condition was specified on the collision report form.

INVOLVEMENT OF DRINKING DRIVERS
IN CASUALTY COLLISIONS
Alberta, 1986-1990

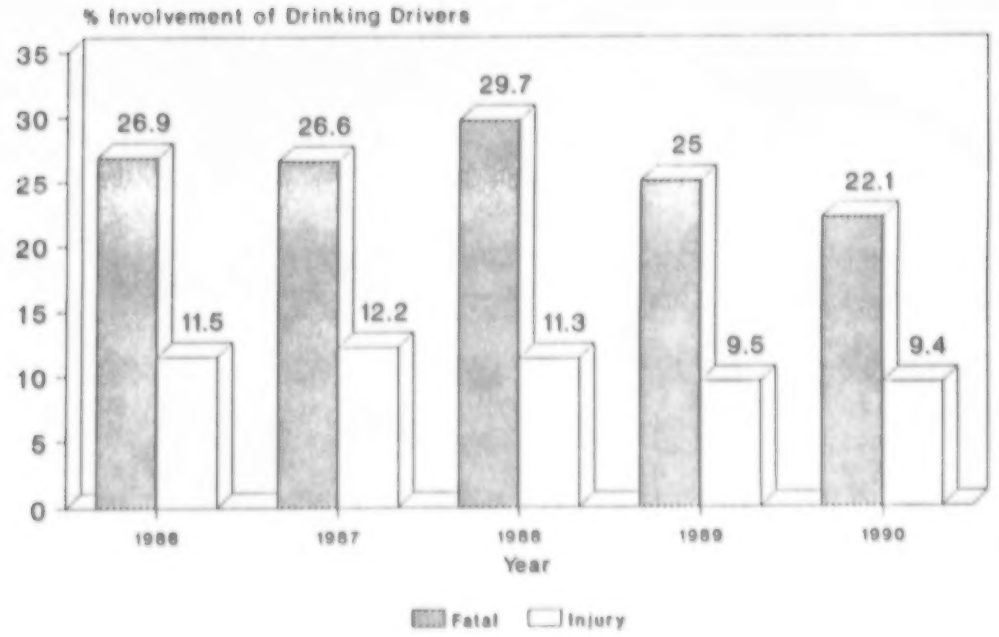


Figure 8

DRIVER CONDITION IN CASUALTY COLLISIONS
Alberta, 1990

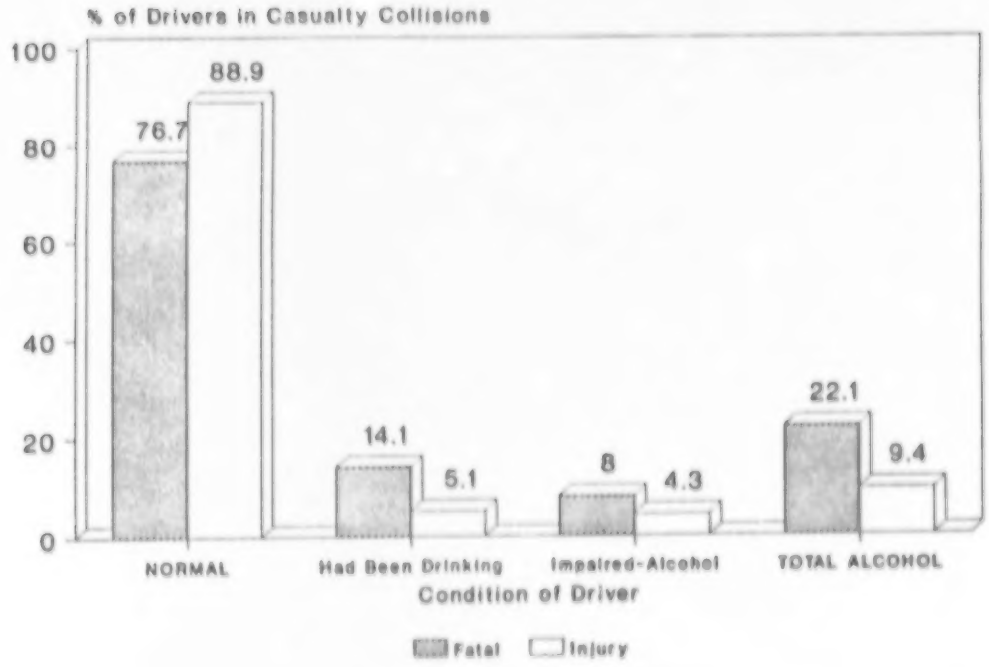


Figure 9

Table 10.2

Alcohol-Involved Casualty Collisions:
Age and Sex of Drinking Drivers
1990

	Male			Female			Total*		
Age in Years	N	%	Rate Per 1000** Licensed Drivers	N	%	Rate Per 1000** Licensed Drivers	N	%	Rate Per 1000** Licensed Drivers
Under 16	9	0.5	0.6	2	0.1	0.2	11	0.6	0.4
16 - 17	75	3.8	2.6	16	0.8	0.6	91	4.6	1.7
18 - 19	180	9.0	4.8	32	1.6	1.0	213	10.7	3.1
20 - 21	176	8.8	4.4	20	1.0	0.5	197	9.9	2.6
22 - 24	210	10.5	3.2	29	1.5	0.5	239	12.0	1.9
25 - 29	338	16.9	2.4	61	3.1	0.5	399	20.0	1.5
30 - 34	233	11.7	1.6	41	2.1	0.3	275	13.8	1.0
35 - 44	297	14.9	1.3	37	1.9	0.2	334	16.7	0.8
45 - 54	101	5.1	0.8	21	1.1	0.2	122	6.1	0.5
55 - 64	52	2.6	0.5	1	0.1	0.0	53	2.7	0.3
65 and over	22	1.1	0.3	2	0.1	0.0	24	1.2	0.2
Unspecified	13	0.7		3	0.2		39	2.0	
TOTAL	**1706**	**85.4**		**265**	**13.3**		**1997**	**100.0**	
Number of Drivers									

Observations

Of those collision-involved drivers who had consumed alcohol, there were over six times as many male drivers as female drivers. The majority were male drivers under the age of 35. In terms of involvement per 1,000 licensed drivers, males 18-21 years of age are more likely to have consumed alcohol prior to a casualty collision than any other age group.

Drinking drivers include those indicated on the collision report form as having been drinking prior to the crash and those who were alcohol-impaired at the time of the crash. Whether or not the driver was actually charged is not taken into consideration by the collision report form.

*Total includes drinking drivers whose sex was not specified on the collision report form.
**Source: Alberta Solicitor General - Motor Vehicles Division. Operator Statistics, December 31, 1990.

AGE AND SEX OF DRINKING DRIVERS INVOLVED
IN CASUALTY COLLISIONS, Alberta 1990
COLLISION RATE PER 1000 LICENSED DRIVERS

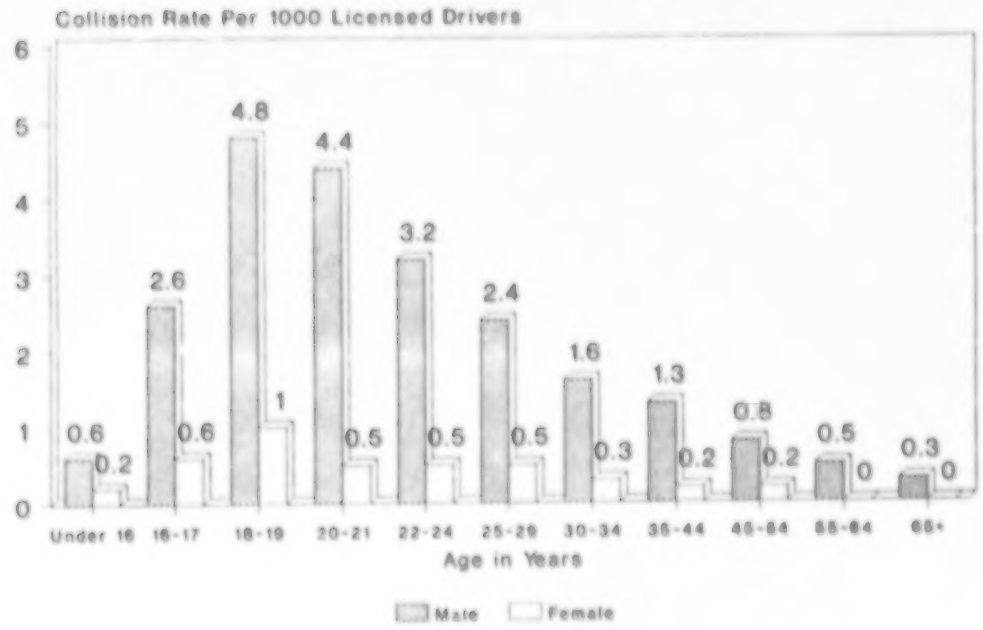


Figure 10

Table 10.3

Alcohol-Involved Casualty Collisions:
Month of Occurrence
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Month	**N**	**%**	**N**	**%**	**N**	**%**
January	8	8.0	106	5.8	114	5.9
February	7	7.0	108	5.9	115	5.9
March	11	11.0	137	7.5	148	7.6
April	5	5.0	147	8.0	152	7.9
May	10	10.0	191	10.4	201	10.4
June	7	7.0	180	9.8	187	9.7
July	10	10.0	188	10.2	198	10.2
August	10	10.0	197	10.7	207	10.7
September	11	11.0	187	10.2	198	10.2
October	9	9.0	129	7.0	138	7.1
November	6	6.0	129	7.0	135	7.0
December	6	6.0	137	7.5	143	7.4
Total Number of Collisions	**100**	**100.0**	**1836**	**100.0**	**1936**	**100.0**

Observations

The months of May to September accounted for the largest proportion of alcohol-involved casualty collisions. The months of January and February accounted for the smallest proportion of alcohol-involved casualty collisions.

Table 10.4

Alcohol-Involved Casualty Collisions:
Day of Week
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Day Of Week	**N**	**%**	**N**	**%**	**N**	**%**
Monday	7	7.0	122	6.6	129	6.7
Tuesday	8	8.0	164	8.9	172	8.9
Wednesday	8	8.0	161	8.8	169	8.7
Thursday	17	17.0	233	12.7	250	12.9
Friday	19	19.0	356	19.4	375	19.4
Saturday	31	31.0	467	25.4	498	25.7
Sunday	10	10.0	333	18.1	343	17.7
Total Number of Collisions	**100**	**100.0**	**1836**	**100.0**	**1936**	**100.0**

Observations

The highest number of alcohol-involved fatal collisions occurred on Fridays and Saturdays (19.0% and 31.0%). The highest number of non-fatal injury collisions occurred on Saturdays (25.4%). The smallest number of alcohol-involved casualty collisions occurred on Mondays.

Table 10.5

Alcohol-Involved Casualty Collisions:
Time Period
1990

	Fatal Collisions		Non-Fatal Injury Collisions		Total Casualty Collisions	
Time of Day	**N**	**%**	**N**	**%**	**N**	**%**
11:00 p.m. - 2:59 a.m.	25	25.0	540	29.4	565	29.2
3:00 a.m. - 6:59 a.m.	13	13.0	306	16.7	319	16.5
7:00 a.m. - 10:59 a.m.	8	8.0	78	4.2	86	4.4
11:00 a.m. - 2:59 p.m.	5	5.0	92	5.0	97	5.0
3:00 p.m. - 6:59 p.m.	21	21.0	293	16.0	314	16.2
7:00 p.m. - 10:59 p.m.	26	26.0	485	26.4	511	26.4
Unspecified	2	2.0	42	2.3	44	2.3
Total Number of Collisions	**100**	**100.0**	**1836**	**100.0**	**1936**	**100.0**

Observations

The late night/early morning time period (11:00 p.m. - 2:59 a.m.) was most likely to record alcohol-involved casualty collisions (29.2%). The morning hours (7:00 a.m. - 10:59 a.m.) were least likely to record alcohol-involved casualty crashes (4.4%).

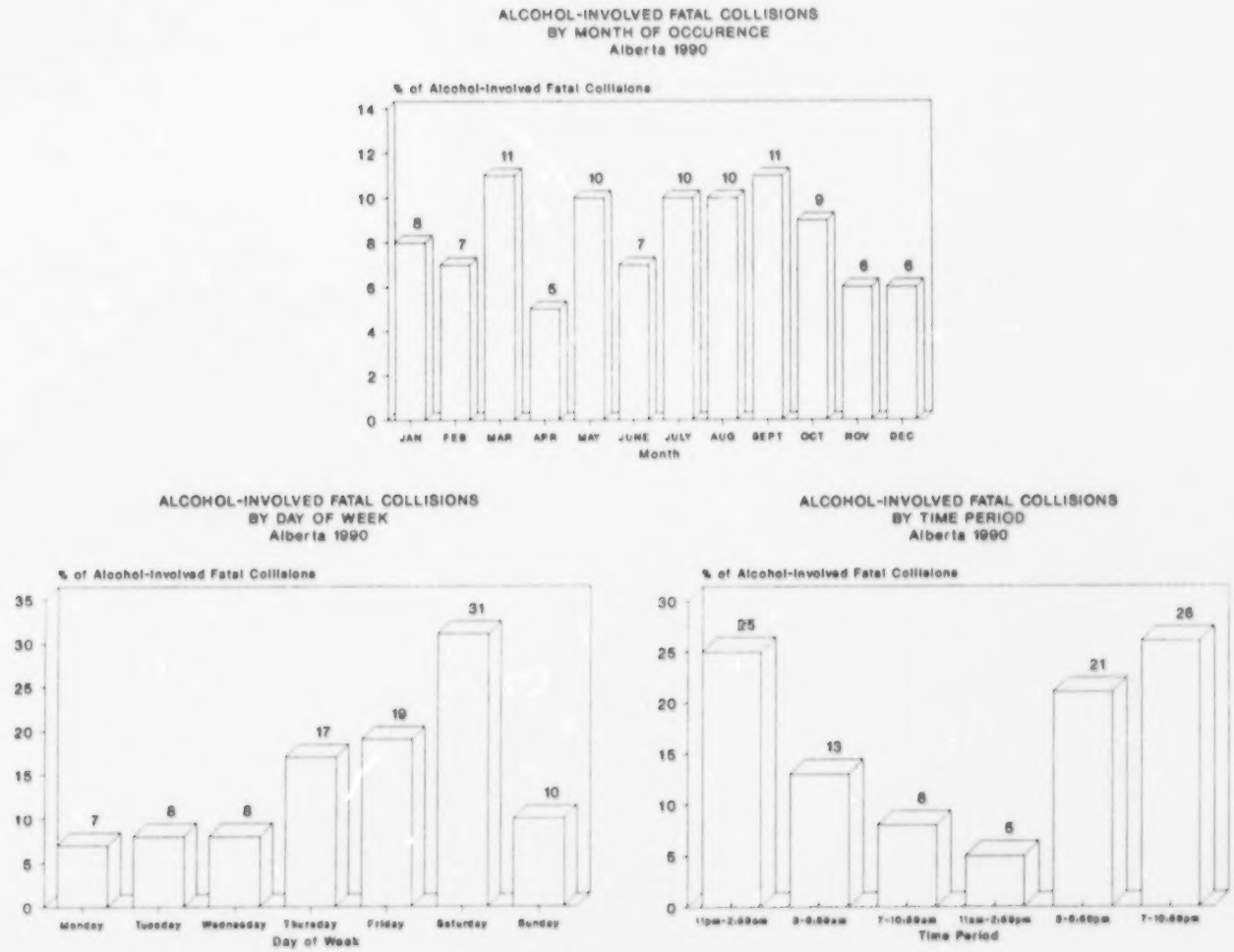

ALCOHOL-INVOLVED FATAL COLLISIONS
BY MONTH OF OCCURENCE
Alberta 1990
% of Alcohol-Involved Fatal Collisions
14
12
10
8
6
4
2
0
8
7
11
5
10
7
10
10
11
9
6
6
JAN
FEB
MAR
APR
MAY
JUNE
JULY
AUG
SEPT
OCT
NOV
DEC
Month
ALCOHOL-INVOLVED FATAL COLLISIONS
BY DAY OF WEEK
Alberta 1990
% of Alcohol-Involved Fatal Collisions
35
30
25
20
15
10
5
0
7
8
8
17
19
31
10
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
Day of Week
ALCOHOL-INVOLVED FATAL COLLISIONS
BY TIME PERIOD
Alberta 1990
% of Alcohol-Involved Fatal Collisions
30
25
20
15
10
5
0
25
13
8
6
21
26
11pm-2:59am
3-6:59am
7-10:59am
11am-2:59pm
3-6:59pm
7-10:59pm
Time Period

Figure 11

Traffic Safety Issues

Restraint Use

- The collision report form collects restraint use information for occupants killed or injured in a collision. The form does not collect restraint use information for individuals involved in a collision who were not killed or injured.

- As the percentage of restraint use increased, the severity of occupant injury decreased.

Table 9.6

Restraint Use of Occupant Casualties and Injury Severity 1990

Injury Severity	Percent Using Restraints*
Fatal	48.2
Major	57.2
Minor	81.8

Observations

The collision report form collects restraint use information for **killed and injured occupants only.** Most of the fatally injured occupants were not restrained at the time of the crash. As the percentage of seat belt use increased, the severity of occupant injury decreased.

Injury Severity

Fatal -A fatal injury is a death of a person that occurs as a result of a motor vehicle collision within 30 days of the collision.

Major -Persons with injuries or complaint of pain that went to the hospital and were subsequently admitted even if for observation only.

Minor -Persons with injuries or complaint of pain that went to the hospital, were treated in emergency (or refused treatment) and SENT HOME without ever being admitted to the hospital.

*Based on those cases where occupant restraint use and injury severity was specified on the collision report form.